Federal Aviation Administration

REDAC / NAS Ops

Review of FY 2018 Proposed Portfolio

Operations Concept Development & Infrastructure (ATDP)

BLI Number: 1A01C

Rob Hunt, AJV-73

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Operations Concept Development & Infrastructure - ATDP

Why is this program necessary?

The FAA is proceeding with NAS modernization based on the NextGen Operational Concept for 2025. Concept development and validation is necessary to investigate specific concept elements, and to drive out operational and technical requirements and implications for human factors, training and procedures. This program assesses the interaction of changing roles and responsibilities of NAS service providers and pilots, airspace changes, procedural changes and new mechanized systems for distributing weather, traffic and other flight related information. It tests the assumptions behind common situational awareness and distributed information processing.

The program uses analyses and associated white papers to validate whether future system requirements meet NextGen goals, including the flight data processing evolution in En Route Automation Modernization (ERAM), data communications, the future voice switch, changes in surveillance requirements and associated procedures, establishment of new roles and responsibilities to support increased productivity, etc. It will develop methods, metrics, and models to demonstrate that the modernized system can handle anticipated growth in traffic demand according to the Terminal Area Forecasts (TAF) for incremental years. This supports the goal of continued US leadership internationally and helps ensure the global harmonization through continued support for the ICAO Global ATM operational concept, the development of global requirements, and the definition of an air transportation performance framework.

FAA

NextGEN

Operations Concept Development & Infrastructure - ATDP

What are the benefits to the FAA

The activity supports the FAA's Strategic Initiatives by delivering benefits through technology and infrastructure; Concept validation supports development, analysis, and simulation of new concepts to assess requirements and to evaluate the impact of the concept on system capacity, efficiency, safety and human performance. Evaluation criteria include the following:

- Impact/Improvement to Air Traffic Service Providers, airspace users, and automation that could increase capacity,
- Impact/Improvement on airspace structure which may increase productivity and hence capacity,
- Impact/Improvement on communication, navigation, and surveillance (CNS) requirements to support the FAA's efforts to reducing cost, increasing capacity and efficiency and;
- Impact/Improvement on automation, display, and facility configuration elements to increase productivity and hence capacity.

What determines program success

Success is measured by the completion of the goals identified in multi-year plans developed for each activity. Initiatives that successfully complete all the project goals identified are then presented as candidates for acquisition.

Operations Concept Development & Infrastructure – ATDP / BLI Number: 1A01C Overview Capabilities

People:

- Program Manager: Rob Hunt
- Subject Matter Experts: Traffic Managers, ATC, Discipline Experts, Airspace User Community
- Research Partners: ANG, NASA, Mitre, Lincoln Labs, Volpe, Academia

Laboratories:

- MITRE
- Tech Center
- DAB Test Bed
- NASA
- Volpe

Accomplishments

Operational Integration Analysis

- Developed operational representation of operational changes to reduce potential risk when implementing mid-term enhancements / capabilities / initiatives
- Performed and documented operational integration analysis/vetting using scenarios for several phases of flight and the NSIP Alpha and Bravo segments. Was conducted with SMEs for En Route, TRACON, Oceanic and En Route Cruise Flight Operations. Analysis
- Illustrated mid-term capability interactions
- Identified key integration and interoperability risk areas (holes, gaps, opportunities)
- Developed potential mitigations for the identified potential risk
- Utilized this program methodology to establish a baseline for assessing future changes

National Special Activity Airspace Project (NSAAP)

- Developed NSAAP Strategic Plan and Multi-Year Project Plan once leadership of NSAAP was transitioned to AJV-7
- Conducted analysis of project artifacts at time of leadership change
- Initiated shortfall analyses and ConUse development, and maturation activities
- Identified requirements gaps between NSAAP and other ongoing activities
- Developed “As is” case and identified the shortfalls for ERAM-SAA Integration for ERAM Sector Enhancement
- Developed SAA-ATM Integration Shortfalls
- Provided SAMS-ERAM integration options/recommendations for ERAM Sector Enhancement
- Continued shortfall analysis and operational scenario development activities for other operational domains
- Identified new requirements for SAMS
- Briefed the National Customer Forum and RTCA Tactical Ops Committee on current and planned activities

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Accomplishments

Enterprise Information Display and Delivery

- Identified AT information integration shortfalls and recommended mitigations
- Conducted Stakeholder meetings to review overall investment and future activities
- Developed budget and schedule estimates to prepare for a CRD RD for the emerging investment (Enterprise Information Display System)
- Finalized program Shortfalls Assessment Documentation
- Achieved CRD RD in 2014
- Drafted Updated ConOps and Final Shortfall Analysis Report
- Preparing numerous other artifacts to support this investment

Terminal Sequencing and Spacing

- Conducted the Terminal Sequencing & Spacing (TSS) Operational Integration Assessment (OIA) at the WJHTC, in partnership with NASA. This event, which involves en route and terminal NATCA controllers and Traffic Management Coordinators (TMC) using TSS and en route metering (along with Ground-Internal Management-Spacing), was designed to assess the interoperability of these capabilities in a high-fidelity environment. Informal feedback from the OIA has been very positive. Formal results are expected to be documented and made available this summer.

RTCA

- This program contributes to the FAA's support for the RTCA, a non-profit association that develops standards based on manufacturers, government, and aviation operator inputs. RTCA also recommends operational improvements to increase the efficiency of air transportation.
- Continued support and analysis of International standard and public/private collaboration

Anticipated Research in FY16 and FY17

PBN Optimization

Objective: Expand the efficient use of PBN procedures in the NAS, leveraging the emerging PBN Strategy

Potential Activities: Concept engineering activities designed to understand the tools necessary to enable the PBN Strategy and achieve capacity, flight efficiency, safety, and other enterprise-level benefits

Trajectory-Based Operations

Objective: Mature Trajectory-Based Operations (TBO) concept

Potential Activities: Leveraging previous trajectory-related elements /activities (PBN, IM, DataComm, system trajectory improvements, RTCA work) and international activities, identify, evaluate, and mature TBO ConOps

Weather Integration

Objective: Evaluate collaborative, event-driven weather-relevant decision making

Potential Activities: Support field evaluations of the collaborative aviation weather statement concept; update preliminary conops and requirements documentation

Operational Integration Analysis

Objective: Continued examination of possible operational integration issues as emerging concepts evolve and new concepts are planned for the mid-term

Potential Activities: Scenario development/update/execution, mitigation recommendations (e.g. further research, reqs)

RTCA Support

Continued support of international standards and public/private collaboration

Emerging FY18 Focal Areas

Trajectory-Based Operations

Objective: Mature Trajectory-Based Operations (TBO) concept

Potential Activities: Continue collaboration with research community, e.g. NASA, to:

- Mature and integrate advanced rerouting and time-based metering operations
- Conduct an end-to-end evaluation of proposed Trajectory-Based Operations, assessing potential ground and/or flight deck solutions to meet system-level requirements
- Develop requirements for and initiate NAS changes to execute mature TBO elements

Operational Integration Analysis

Objective: Continued examination of possible operational integration issues as emerging concepts evolve and new concepts are planned for the mid-term

Potential Activities: Scenario development/update/execution, mitigation recommendations (e.g. further research, requirements)

RTCA Support

Continued support of international standards and public/private collaboration

Questions?